

TABLE 1

—Japanese Patent Application «Publication number : 60-200842»—
JP-A-60200842

wt%	1	2	3	4	5	6	7	8
SiO ₂	66.00%	66.00%	66.00%	66.00%	61.00%	60.00%	68.00%	60.00%
Al ₂ O ₃	3.00%	3.00%	3.00%	3.00%	2.00%	1.00%	2.00%	4.00%
B ₂ O ₃	18.00%	18.00%	18.00%	18.00%	21.00%	20.00%	16.00%	24.00%
K ₂ O	8.00%	8.00%	8.00%	8.00%	12.00%	9.00%	8.00%	5.00%
Na ₂ O	5.00%	5.00%	5.00%	5.00%	1.00%	5.00%	6.00%	3.00%
Li ₂ O								3.00%
ZnO						3.00%	5.00%	1.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
F		0.10%	1.00%	3.00%	3.00%	5.00%	2.00%	4.00%
T %	77.5	78.0	78.5	80.0	80.5	82.0	79.0	81.5

Divisional Claim-1,2,3	1	2	3	4	5	6	7	8
P ₂ O ₅	4 - 39%	OK						
Al ₂ O ₃	0 - 9%	×	×	×	×	×	×	×
MgO	0 - 5%	×	×	×	×	×	×	×
CaO	0 - 6%	×	×	×	×	×	×	×
SrO	0 - 9%	×	×	×	×	×	×	×
BaO	0 - 10%	×	×	×	×	×	×	×
Y ₂ O ₃	0 - 10%	×	×	×	×	×	×	×
La ₂ O ₃	0 - 10%	×	×	×	×	×	×	×
Gd ₂ O ₃	0 - 20%	×	×	×	×	×	×	×
Yb ₂ O ₃	0 - 10%	×	×	×	×	×	×	×
TiO ₂	0 - 0.1%	×	×	×	×	×	×	×
SnO ₂	0 - 1%	×	×	×	×	×	×	×
As ₂ O ₃	0 - 0.5%	×	×	×	×	×	×	×
Sb ₂ O ₃	0 - 0.5%	×	×	×	×	×	×	×
AlF ₃	0 - 29%	×	×	×	×	×	×	×
MgF ₂	0 - 8%	×	×	×	×	×	×	×
CaF ₂	0 - 27%	×	×	×	×	×	×	×
SrF ₂	0 - 27%	×	×	×	×	×	×	×
BaF ₂	10 - 47%	OK						
YF ₃	0 - 10%	×	×	×	×	×	×	×
LaF ₃	0 - 10%	×	×	×	×	×	×	×
GdF ₃	0 - 10%	×	×	×	×	×	×	×
LiF	0 - 3%	×	×	×	×	×	×	×
NaF	0 - 1%	×	×	×	×	×	×	×
KF	0 - 1%	×	×	×	×	×	×	×
Y ₂ O ₃ +La ₂ O ₃ +Gd ₂ O ₃ +Yb ₂ O ₃	0 - 20%	×	×	×	×	×	×	×
MgF ₂ +CaF ₂ +SrF ₂ +BaF ₂	30 - 70%	OK						
F	10 - 45%	OK						

TABLE 2

— Japanese Patent Application <<Publication number : 60-077144 >> —

JP-A-60077144

wt%	MW	1	2	3	4	5	6	7
SiO ₂	60.0843	56.70%	57.70%	57.10%	63.60%	64.60%	65.20%	67.70%
B ₂ O ₃	69.6202	29.10%	27.60%	23.20%	22.60%	21.80%	19.70%	18.40%
Na ₂ O	61.97894		7.00%	10.60%	6.10%	7.20%	1.20%	6.20%
NaF	41.9881732	6.70%					11.00%	
Al ₂ O ₃	101.961276					2.10%	2.90%	
AlF ₃	83.9767476	7.50%	7.70%	9.10%	7.70%	4.30%		7.70%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
F 還元剤 Reducing agent		8.20%	5.20%	6.10%	5.20%	2.90%	5.00%	5.20%
T 25.3		81.2	84.5	80	85	81	80.2	82
α		50	52	58	42	43	53	38
T _g		395	390	450	400	440	480	480

※Recalculation: Each fluoride → Each oxide

wt%	mw	1	2	3	4	5	6	7
SiO ₂		59.50%	62.51%	62.82%	68.91%	67.50%	67.13%	73.35%
B ₂ O ₃		30.54%	29.90%	25.52%	24.49%	22.78%	20.28%	19.93%
Na ₂ O		5.19%	7.58%	11.66%	6.61%	7.52%	9.60%	6.72%
Al ₂ O ₃		4.78%	0.00%	0.00%	0.00%	2.19%	2.99%	0.00%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
F 還元剤 Reducing Agent		8.20%	5.20%	6.10%	5.20%	2.90%	5.00%	5.20%
T 25.3		81.2	84.5	80	85	81	80.2	82
α		50	52	58	42	43	53	38
T _g		395	390	450	400	440	480	480

Desirational Claim-1,2,3

	1	2	3	4	5	6	7
P ₂ O ₅	4 - 39%	OK	OK	OK	OK	OK	OK
Al ₂ O ₃	0 - 9%	×	×	×	×	×	×
MgO	0 - 5%	×	×	×	×	×	×
CaO	0 - 6%	×	×	×	×	×	×
SrO	0 - 9%	×	×	×	×	×	×
BaO	0 - 10%	×	×	×	×	×	×
Y ₂ O ₃	0 - 10%	×	×	×	×	×	×
La ₂ O ₃	0 - 10%	×	×	×	×	×	×
Gd ₂ O ₃	0 - 20%	×	×	×	×	×	×
Yb ₂ O ₃	0 - 10%	×	×	×	×	×	×
TiO ₂	0 - 0.1%	×	×	×	×	×	×
SnO ₂	0 - 1%	×	×	×	×	×	×
As ₂ O ₃	0 - 0.5%	×	×	×	×	×	×
Sb ₂ O ₃	0 - 0.5%	×	×	×	×	×	×
AlF ₃	0 - 29%	×	×	×	×	×	×
MgF ₂	0 - 8%	×	×	×	×	×	×
CaF ₂	0 - 27%	×	×	×	×	×	×
SrF ₂	0 - 27%	×	×	×	×	×	×
BaF ₂	10 - 47%	×	×	×	×	×	×
YF ₃	0 - 10%	×	×	×	×	×	×
LaF ₃	0 - 10%	×	×	×	×	×	×
GdF ₃	0 - 10%	×	×	×	×	×	×
LiF	0 - 3%	×	×	×	×	×	×
NaF	0 - 1%	OK	×	×	×	OK	×
KF	0 - 1%	×	×	×	×	×	×
Y ₂ O ₃ +La ₂ O ₃	0 - 20%	×	×	×	×	×	×
+Gd ₂ O ₃ +Yb ₂ O ₃							
MgF ₂ +CaF ₂	30 - 70%	OK	OK	OK	OK	OK	OK
+SrF ₂ +BaF ₂							
F	10 - 45%	OK	OK	OK	OK	OK	OK

Kindly revise Tables 5-9 as follows:

Table 5

(mass %)

	25	26	27	28	29	30	31
SiO ₂	64.950	55.850	55.350	42.000	35.550	30.000	68.990
B ₂ O ₃	14.900	13.050	6.050	13.600	16.000	20.000	11.100
Al ₂ O ₃	2.300	0.500	0.600	4.200	4.500	5.500	
Li ₂ O			3.000	2.000	2.000	2.000	
Na ₂ O	9.250		1.200	0.300	0.300		9.550
K ₂ O	6.850	11.450	8.700				7.750
BaO			16.850	37.050	40.750	40.000	1.550
ZnO			5.750				1.000
PbO	1.095		2.000		0.500		
TiO ₂	0.005	0.050		0.100			0.010
As ₂ O ₃	0.150		0.250	0.400	0.400	0.300	
Sb ₂ O ₃		0.010	0.250				0.050
K ₂ SiF ₆		19.090					
KHF ₂	0.500			0.350		0.200	
CaO						2.000	
Total	100.000	100.000	100.000	100.000	100.000	100.000	100.000
F	0.243	9.879		0.170		0.097	
Nd	1.5163	1.4875	1.5567	1.5891	1.6031	1.6056	1.5163
N _v d	64.1	70.2	58.7	61.2	60.6	61.1	64.1
Δ n(ppm)	0.7	0.0	0.5	0.5	0.7	0.3	0.0

Table 6
(mass 5)

	32	33	34	35	36	37	38
SiO ₂	67.20	67.80	40.00	34.55	49.00	55.80	35.50
B ₂ O ₃	3.60	4.10	12.30	18.00	17.90	13.05	16.00
Al ₂ O ₃			4.50	5.50	0.30	0.50	4.50
Li ₂ O			2.00				2.00
Na ₂ O	12.50	12.10	0.30	0.30			0.50
K ₂ O	6.13	6.15			12.00	11.40	0.20
BaO	10.22	9.45	38.00	38.75			40.80
PbO				0.50			
TiO ₂		0.20	0.50			0.04	0.10
As ₂ O ₃	0.35		0.40	0.40	0.20	0.01	0.40
Sb ₂ O ₃		0.20					
K ₂ SiF ₆						19.20	
KHF ₂					20.60		
SrO			2.00				
ZrO ₂				2.00			
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00
F					10.02	9.94	
Nd	1.5184	1.5184	1.5962	1.5989	1.4850	1.4860	1.6025
N v d	60.3	60.3	60.5	60.3	70.1	69.7	60.5
Δ n(ppm)	0.4	0.2	0.4	0.3	0.1	0.1	0.5

Table 7

(mass %)

	39	40	41	42	43	44	45	46
P ₂ O ₅	27.45	22.45	21.05	5.55	10.85	9.35	19.40	4.85
Al ₂ O ₃	6.55	5.35	5.05	1.35	2.60	2.20	3.95	1.15
AlF ₃	7.25	11.55	12.45	24.30	24.05	28.30		27.20
MgF ₂	4.45	6.05	5.10	5.20	4.25	5.30		4.05
CaF ₂	11.20	15.80	16.05	25.55	20.95	16.65		20.20
SrF ₂	18.00	20.35	25.85	26.10	24.00	26.75	22.00	21.55
BaF ₂	25.10	18.45	14.45	11.80	13.20	10.65	44.50	15.00
YF ₃								5.00
NaF					0.10			
KF				0.15				1.00
Y ₂ O ₃							3.00	
La ₂ O ₃							5.00	
SnO ₂							0.05	
SrO						0.80	2.10	
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
F	23.97	29.37	30.32	42.60	39.28	40.94	16.30	42.94
Nd	1.5296	1.5043	1.5006	1.4353	1.4505	1.4541	1.5632	1.4388
N _v d	76.2	79.4	81.1	85.5	81.6	90.5	69.8	95.1
Δ n(ppm)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0

Table 8

(mass %)

	47	48	49	50	51	52	53	54
P ₂ O ₅	25.00	38.20	22.60	20.00	32.15	21.50	11.70	20.15
Al ₂ O ₃	6.00	8.60	5.40		1.80	3.30	2.80	2.55
AlF ₃				10.00	7.50		26.50	13.75
MgF ₂			0.50		2.35	8.00	4.00	4.90
CaF ₂		9.00		10.00	7.00	15.00	14.00	15.40
SrF ₂	15.00		14.00	20.00	9.20	13.00	23.00	15.85
BaF ₂	28.00	22.00	47.00	20.00	25.00	22.00	12.00	15.80
YF ₃		3.00						
LaF ₃	5.00		2.00					
GdF ₃						10.00		2.60
LiF			2.50					
Y ₂ O ₃	10.00	5.50	6.00					
La ₂ O ₃	10.00	6.20						
Gd ₂ O ₃		5.00		20.00		5.00		
SnO ₂	1.00							
MgO					5.00	2.20		
CaO							6.00	
SrO								9.00
BaO		2.40			10.00			
As ₂ O ₃		0.10						
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
F	12.06	16.83	17.14	22.04	22.21	23.54	36.80	28.73
Nd	1.5826	1.5913	1.5583	1.5783	1.5532	1.5022	1.4565	1.4973
N _v d	70.3	72.6	70.6	72.0	71.2	79.2	90.1	80.9
Δ n(ppm)	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2

Table 9
(mass %)

	55	56	57	58	59
P_2O_5	4.00	25.00	25.00	11.70	24.00
Al_2O_3	1.00	7.00	6.00	2.80	6.00
AlF_3	27.00			25.50	
MgF_2	5.00			4.50	2.00
CaF_2	21.00		5.00	13.50	2.00
SrF_2	21.00	15.00	15.00	22.50	13.00
BaF_2	16.00	19.00	23.00	12.50	27.00
YF_3	5.00	10.00			
LaF_3		5.00	10.00		5.00
NaF				1.00	
Y_2O_3			10.00		5.00
La_2O_3		10.00			5.00
Gd_2O_3			5.00		
Yb_2O_3					10.00
CaO				6.00	
SrO			1.00		
BaO		9.00			1.00
Total	100.00	100.00	100.00	100.00	100.00
F	37.52	29.12	14.87	36.59	13.13
Nd	1.4378	1.5816	1.5822	1.4562	1.5820
$\Delta n(ppm)$	0.1	0.1	0.2	0.1	0.1